


Medicinal Plants and Headache: A Review of the Most Commonly Used Herbal Analgesics for Headache Relief

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Article Info	ABSTRACT
<p>Article type: Review Article</p> <p>Article History: Received: 20 Feb 2025 Revised: 17 May 2025 Accepted: 20 May 2025 Published Online:</p> <p> Correspondence to: Ali Akbar Nasiri</p> <p>Email: nasiriali7@gmail.com</p>	<p>Objective: Headache is one of the most common somatic complaints, often triggered by factors such as stress, fatigue, dehydration, or neurological disturbances. Its manifestations vary in type and intensity and frequently impair quality of life. Treatment depends largely on identifying the underlying cause and may involve lifestyle modifications in combination with pharmacological interventions. However, recurrent use of synthetic analgesics can lead to complications such as gastrointestinal irritation, hepatic damage, and drug dependence. Caution is therefore warranted, and medical supervision is recommended when using such medications. In this context, the present review highlights the principal medicinal plants employed in Iranian traditional medicine for headache management.</p> <p>Methodology: A comprehensive literature search was performed using the keywords “medicinal plants,” “headache,” “traditional medicine,” and “Iran” across major scientific databases, including PubMed, Scopus, Google Scholar, and Web of Science.</p> <p>Results: The review identified a wide range of herbs traditionally used in Iranian medicine for headache relief. These include peppermint, valerian, lavender, coriander, German chamomile, sage, licorice, vervain, black tea, ginger, violet, green tea, Syrian rue, basil, thyme, cinnamon, rosemary, lemon balm, St. John’s wort, black pepper, willow, passionflower, orange blossom, borage, oregano, saffron, fennel, Damask rose, marshmallow, hyssop, and walnut.</p> <p>Conclusion: Iranian traditional medicine provides a rich pharmacopeia of medicinal plants that represent effective and generally well-tolerated alternatives to synthetic treatments for headache. These remedies offer a natural therapeutic option with fewer side effects. Nevertheless, further clinical research is required to validate their efficacy and facilitate their integration into evidence-based medical practice.</p> <p>Keywords: Brain, Head, Headache, Treatment, Medicinal plants, Traditional medicine, Iran</p>
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Introduction

Pain is not only a highly noxious experience per se, but it can also have an overwhelmingly negative effect on nearly every other aspect of life [1]. Headache is among the most prevalent physical ailments, affecting individuals of all age groups worldwide [2]. This condition may arise from a variety of factors, including stress, dehydration, fatigue, postoperative side effects, or neurological disorders, and it significantly impacts the quality of life [3, 4]. Headaches present in various forms, with tension-type, migraine, and cluster headaches being the most common. Each type has distinct causes, symptoms, and intensities, requiring accurate diagnosis and tailored therapeutic approaches [5]. Treatment of headaches typically involves lifestyle modifications, stress management, and the use of conventional analgesic medications [5]. While chemical analgesics and anti-inflammatory drugs can provide rapid relief, their frequent and prolonged use is associated with a range of serious side effects [6].

The pathophysiology of headaches is multifactorial and varies depending on the type. Generally, headaches result from irritation or inflammation of pain-sensitive structures in the skull, such as blood vessels, cranial nerves, muscles, and the meninges [7]. In migraines, in particular, neurological disturbances including abnormal brain activity and the release of chemical mediators like serotonin and prostaglandins lead to vasodilation and inflammation of surrounding tissues, which ultimately trigger pain [8]. Tension-type headaches, on the other hand, are closely linked to muscle tension and spasms in the head and neck, which stimulate pain receptors. Moreover, psychological factors such as stress and anxiety can exacerbate pain by amplifying neural pain pathways [9].

Although chemical analgesics remain a common treatment option, their recurrent and long-term use may lead to adverse effects such as gastrointestinal disorders (e.g., ulcers and indigestion), hepatic and renal impairment, drug dependence, and diminished efficacy over time [10,11]. Additionally, overuse of these medications can result in rebound headaches, a condition known as medication-overuse headache [12]. Therefore, the administration of such drugs should be conducted with caution and under medical supervision. This has led to growing interest in natural

alternatives with fewer side effects for headache relief [13].

Traditional Iranian Medicine (TIM), with its deep-rooted history, has long advocated the use of medicinal herbs for treating various ailments [14], including headaches [15]. Utilizing the anti-inflammatory, sedative, and analgesic properties of plants, TIM offers natural and safe solutions for pain relief [16]. Numerous studies have highlighted the efficacy of herbs such as *Mentha*, *Valeriana officinalis* (valerian), *Matricaria chamomilla*, and *Zingiber officinale* in alleviating headaches and reducing their frequency and intensity [17]. The present review aims to identify and present the most prominent medicinal plants traditionally used in Iran for the management of headaches.

Methodology

To collect data and identify medicinal plants effective in treating headaches, a comprehensive literature search was conducted through both classical manuscripts and electronic scientific databases, including PubMed, Scopus, Google Scholar, and Web of Science. Keywords used in the search strategy included "medicinal plants," "headache," "traditional medicine," and "Iran."

Inclusion Criteria

- Articles published in Persian or English between 2000 and 2024
- Traditional studies focusing on medicinal plants used for headache treatment

Exclusion Criteria

- Articles unrelated to headaches or medicinal plants
- Studies without full-text access
- Research focusing exclusively on pharmaceutical drugs or lacking reliable data
- Articles published in languages other than Persian or English

After screening and data extraction, the identified medicinal plants were categorized based on their frequency of use and reported efficacy in traditional sources.

Results

The findings of this review reveal that traditional Iranian medicine employs a wide array of plants for headache relief. These include *Mentha* spp., *Valeriana officinalis*, *Lavandula angustifolia*, *Coriandrum sativum*, *Tanacetum parthenium*, *Salvia officinalis*, *Glycyrrhiza glabra*, *Verbena officinalis*, *Camellia sinensis*, *Zingiber officinale*, *Viola odorata*, *Peganum*

harmala, *Ocimum basilicum*, *Thymus vulgaris*, *Cinnamomum verum*, *Rosmarinus officinalis*, *Melissa officinalis*, *Hypericum perforatum*, *Piper nigrum*, *Salix alba*, *Passiflora incarnata*, *Citrus aurantium*, *Borago officinalis*, *Origanum vulgare*, *Crocus sativus*, *Foeniculum vulgare*, *Rosa damascena*, *Althaea officinalis*, *Hyssopus officinalis*, and *Juglans regia*. These herbs hold significant positions in traditional medical texts, and their analgesic and calming properties have been historically recognized for headache relief.

A detailed summary of their botanical characteristics and traditional uses is presented in Table 1

Table 1: Medicinal plants traditionally used for relieving headaches in Iranian medicine and their possible mechanisms of action

Persian Name	English Name	Scientific Name	Botanical Family	Plant Part Used	Possible Mechanism of Action
Naena	Peppermint	<i>Mentha piperita</i>	Lamiaceae	Leaf	Anti-inflammatory, sedative, muscle relaxant
Sanbal-al-Tayyeb	Valerian	<i>Valeriana officinalis</i>	Caprifoliaceae	Root	Sedative, anxiolytic, nervous system modulator
Ostokhoddus	Lavender	<i>Lavandula angustifolia</i>	Lamiaceae	Flower	Sedative, anti-anxiety, analgesic
Babooneh Gavi	German Chamomile	<i>Matricaria chamomilla</i>	Asteraceae	Flower	Anti-inflammatory, calming, pain reliever
Shirin Bayan	Licorice	<i>Glycyrrhiza glabra</i>	Fabaceae	Root	Anti-inflammatory, analgesic, hepatoprotective
Zanjabil	Ginger	<i>Zingiber officinale</i>	Zingiberaceae	Root	Anti-inflammatory, analgesic, improves blood circulation
Darchin	Cinnamon	<i>Cinnamomum verum</i>	Lauraceae	Bark	Anti-inflammatory, circulation enhancer, antioxidant
Felfel Siyah	Black Pepper	<i>Piper nigrum</i>	Piperaceae	Dried fruit	Enhances drug absorption, anti-inflammatory, analgesic
Rozmary	Rosemary	<i>Rosmarinus officinalis</i>	Lamiaceae	Leaf	Anti-inflammatory, circulation enhancer, analgesic
Avishan	Thyme	<i>Thymus vulgaris</i>	Lamiaceae	Leaf	Anti-inflammatory, antimicrobial, calming

Discussion

Traditional Iranian medicine, as one of the oldest and richest medical systems in the world, is rooted in thousands of years of experience, clinical observations, and the integration of medical knowledge with Iranian philosophy and wisdom. This therapeutic school adopts a holistic view of the human body and mind, considering diseases as the result of imbalances in the humors (temperaments). It emphasizes prevention, lifestyle modification, and the use of natural remedies. Headache is one of the most common complaints in modern societies, with diverse etiologies including gastrointestinal disorders, nervous tension, sleep deprivation, climatic changes, and cervical problems. In traditional Iranian medicine, headaches are classified based on their origin and quality, and specific treatments are prescribed for each type, focusing on temperament correction, dietary regimen, and medicinal plants [33].

According to ethnobotanical records from Iran, medicinal plants such as *Matricaria recutita*, *Paliurus spina*, *Papaver rhoeasa*, *Viola tricolor*, *Fumaria asepsala*, *Heracleum persicum*, *Viola odorata*, *Portulaca oleracea* L., *Chrysanthemum coronarium* L., *Pyrus syriaca* Boiss., *Ferula oopoda* Boiss., *Tanacetum polycephalum*, *Withania somnifera* L., *Crataegus aronia* L., *Nardostachys jatamansi*, *Hypericum scabrum* L., *Lawsonia inermis* L., *Althaea officinalis* L., *Hypericum perforatum* L., *Lavandula vera* L., *Rosmarinus officinalis* L., and *Potentilla elvendsensis* Boiss. are traditionally used for migraine treatment [34].

Ethnobotanical studies in Iran have identified species such as *Salvia haydragea* DC., *Astragalus hamosus* L., *Hyoscyamus kotschymanus* Pojark, *Hypericum scabrum* L., *Valeriana officinalis*, *Origanum vulgare* L., *Anthemis hyalina* DC., *Adiantum capillus-veneris* L., and *Dracocephalum multicaule* Montbr. & Auch as effective in treating headaches [35]. Specifically, in Shahrekord, Iran, the same plants have been reported for headache management [36].

Herbal therapy, as a fundamental pillar of traditional Iranian medicine, holds a special place in headache treatment. The use of plants such as *Lavandula angustifolia*, *Borago officinalis*, *Matricaria chamomilla*, *Valeriana officinalis*, and *Coriandrum sativum*, which possess sedative, anti-inflammatory, and nerve-strengthening properties, has played a significant role in alleviating nervous, biliary, phlegmatic, and melancholic headaches [34].

Headache is one of the most frequent complaints in clinical practice, with possible neurological, muscular, inflammatory, or vascular origins. Medicinal plants with multiple pharmacological effects such as anti-inflammatory, sedative, muscle relaxant, analgesic, and nervous system regulatory properties can effectively reduce headache intensity and frequency [35–37]. Through mechanisms like inflammation inhibition, pain relief, nervous system calming, muscle

relaxation, and improved cerebral circulation, these plants can significantly contribute to headache management. Active compounds including menthol, piperine, and flavonoids affect neural and vascular pathways to alleviate headache symptoms. The combined use of these herbs offers a natural and effective approach to headache management [37–40].

Conclusion

Centuries of experience in using these herbal remedies, alongside invaluable written sources such as Avicenna's Canon of Medicine and Rhazes' Al-Hawi, provide a treasure trove of useful information for contemporary researchers and practitioners. Today, with the growing global interest in natural and indigenous therapies, a scientific reevaluation and documentation of traditional Iranian medicine's experiences in headache treatment could open new horizons for offering effective, low-side-effect, and cost-effective therapies.

Statements and Declarations

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

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References

1. Jahangiri Fard A, Babae T, Alavi SM, Nasiri AA, Ghoreishi SM, Noori NM, et al. Intravenous patient-controlled remifentanyl versus paracetamol in post-operative pain management in patients undergoing coronary artery bypass graft surgery. *Anesth Pain Med*. 2014;4(5): 19862. doi: 10.5812/aapm.19862. doi: 10.5812/aapm.19862.
2. Silberstein SD. Headache in clinical practice. London: Routledge; 2018.
3. Robbins MS. Diagnosis and management of headache: a review. *JAMA*. 2021;325(18):1874–85.
4. Rahimi M, Golparvar M, Hashemi ST, Nasiri A. The effect of adding magnesium sulfate, neostigmine and fentanyl to ropivacaine on sensory-motor block properties in lower extremity surgery under spinal anesthesia. *J Isfahan Med*

- Sch. 2022;40(689):766–74. doi: 10.48305/jims.v40.i689.0766.
5. Rasmussen BK. Epidemiology of headache. *Cephalalgia*. 1995;15(1):44–67. doi: 10.1046/j.1468-2982.1995.1501045.x.
 6. Vikelis M, Spingos KC, Rapoport AM. A new era in headache treatment. *Neurol Sci*. 2018;39(Suppl 1):47–58.
 7. Robbins MS. Diagnosis and management of headache: a review. *JAMA*. 2021;325(18):1874–85.
 8. Ogunlaja OI, Goadsby PJ. Headache: treatment update. *eNeurologicalSci*. 2022;29:100420. doi: 10.1016/j.ensci.2022.100420
 9. Moskowitz MA. Pathophysiology of headache—past and present. *Headache*. 2007;47:1–2.
 10. Diener HC, Dodick D, Evers S, Holle D, Jensen RH, Lipton RB, et al. Pathophysiology, prevention, and treatment of medication overuse headache. *Lancet Neurol*. 2019;18(9):891–902.
 11. Diener HC, Dodick D, Evers S, Holle D, Jensen RH, Lipton RB, et al. Pathophysiology, prevention, and treatment of medication overuse headache. *Lancet Neurol*. 2019;18(9):891–902.
 12. Silberstein SD. Headache in clinical practice. Routledge; 2018 May 8.
 13. Levin M. Herbal treatment of headache. *Headache*. 2012;52(Suppl 2):76–80.
 14. Nasiri AA. Anesthetic herbs: a review of the most important anesthetic medicinal plants in traditional medicine. *Plant Biotechnol Persa*. 2025;7(4):0–.
 15. Nesbitt AD, Leschziner GD, Peatfield RC. Headache, drugs and sleep. *Cephalalgia*. 2014;34(10):756–66.
 16. Jónsdóttir M, Meyer JS, Rogers RL. Efficacy, side effects and tolerance compared during headache treatment with three different calcium blockers. *Headache*. 1987;27(7):364–9.
 17. Prajapati S, Vinode PK. Various remedies for management of migraine: a short review. *Aten Primaria*. 2022;54(2):1–5.
 18. Amini M, editor. *Makhzan al-Adwiyah*. 1st ed. Tehran: Institute of Medical History, Islamic and Complementary Medicine, Iran University of Medical Sciences; 2008.
 19. Ansari M. *Ikhtiyarat Badi'i*. 1st ed. Tehran: Institute of Medical History, Islamic and Complementary Medicine, Iran University of Medical Sciences; 2009.
 20. Qarashi A. *Qarabadin-e-Kabir*. 2nd ed. Tehran: Institute of Medical History, Iranian Traditional Medicine; 2010.
 21. Zargari A. *Medicinal Plants*. Vols. 1–5. Tehran: Tehran University Publications; 1990.
 22. Avicenna (Ibn Sina). *The Canon of Medicine (Al-Qanun fi al-Tibb)*. 1st ed. Sharafkandi A, translator. Tehran: Soroush Press; 2005.
 23. Nazem J. *Exir-e Azam (The Great Elixir)*. Vols. 1–4. Tehran: Institute of Medical History; 2011.
 24. Rhazes (al-Razi). *Al-Hawi (Liber Continens)*. 1st ed. Tehran: Institute for the History of Science; 2009.
 25. Tabarsi A. *Tohfah al-Mu'minin*. 2nd ed. Qom: Esmaeilian Publishing; 2006.
 26. Ahvazi AIA. *Kamel al-Sanaat al-Tibbiyya*. Vols. 1–3. Tehran: Research Institute of Iranian Traditional Medicine; 2012.
 27. Arzani MA. *Tibb-e-Akbar*. 1st ed. Tehran: Research Institute of Iranian Traditional Medicine; 2008.
 28. Chashti N. *Yadgar-e-Hakim*. 1st ed. Tehran: Institute for Traditional Medicine Studies; 2010.
 29. Jorjani I. *Zakhireye Kharazmshahi (Treasure of Kharazmshah)*. Vols. 1–2. Tehran: Iranian Academy of Medical Sciences; 2008.
 30. Ghaeni H. *An Introduction to Iranian Medicinal Plants*. 1st ed. Mashhad: Ferdowsi University Press; 2004.
 31. Mozaffarian V. *Identification of Medicinal and Aromatic Plants of Iran*. 1st ed. Tehran: Farhang Moaser Publishers; 2006.
 32. Rechinger KH. *Flora Iranica*. Vols. 1–176. Graz: Akademische Druck- und Verlagsanstalt; 1963–2010.
 33. McCluggage LK. *Herbal medications*. About the Oxford American Handbooks in Medicine. 2009:159.
 34. Jivad N, Asadi-Samani M, Moradi MT. The most important medicinal plants effective on migraine: a review of ethnobotanical studies in Iran. *Der Pharma Chemica*. 2016;8(2):462–6. Available from: <http://derpharmachemica.com/archive.html>
 35. Rouhi-Boroujeni H, Asadi-Samani M, Moradi MT. A review of the medicinal plants effective on headache based on the ethnobotanical documents of Iran. *Der Pharm Lett*. 2016;8(3):37–42. Available from: <http://scholarsresearchlibrary.com/archive.html>
 36. Abbaszadeh S, Karami N, Bahmani F, Abbasi N. Headache and herbal medicine: An ethnobotanical study of Shahrekord, Southwest of Iran. *Plant Biotechnol Persa*. 2019;1(1):10–7. <https://dor.isc.ac/dor/20.1001.1.26767414.2019.1.1.4.8>
 37. Wei TH, Hsieh CL. Headaches, migraine, and herbal medicine. In: *Treatments, nutraceuticals, supplements, and herbal medicine in neurological disorders*. 1st ed. San Diego: Academic Press; 2023. p. 401–19.
 38. Rawat C, Kukal S, Dahiya UR, Kukreti R. Cyclooxygenase-2 (COX-2) inhibitors: future therapeutic strategies for epilepsy management. *J Neuroinflammation*. 2019;16(1):197.
 39. Ajmone-Cat MA, Bernardo A, Greco A, Minghetti L. Non-steroidal anti-inflammatory drugs and brain inflammation: effects on microglial functions. *Pharmaceuticals*. 2010;3(6):1949–65. doi: 10.3390/ph3061949.
 40. Dhir A. An update of cyclooxygenase (COX)-inhibitors in epilepsy disorders. *Expert Opin Investig Drugs*. 2019;28(2):191–205. doi: 10.1080/13543784.2019.1557147.